

Exhibit 8

PLAINTIFFS' RESPONSE TO DEFENDANTS' MOTION TO EXCLUDE GENERAL CAUSATION TESTIMONY OF PLAINTIFFS' EXPERTS

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA**

PEOPLE OF THE STATE OF CALIFORNIA,
et al.,
Plaintiffs,

v.

META PLATFORMS, INC, Instagram, LLC,
Meta Payments, Inc., Meta Platforms
Technologies, LLC., et al.,
Defendants

IN RE: SOCIAL MEDIA ADOLESCENT
ADDICTION/PERSONAL INJURY
PRODUCTS LIABILITY LITIGATION

THIS DOCUMENT RELATES TO:
4:23-cv-05448

MDL No. 3047

Case No. 4:23-cv-05448-YGR

Judge: Hon. Yvonne Gonzalez Rogers

Magistrate Judge: Hon. Peter H. Kang

TRIAL REPORT OF BRADLEY ZICHERMAN, MD

May 16, 2025

Table of contents

| | |
|--|-----|
| I. Introduction | 2 |
| I.A. Summary of opinions..... | 2 |
| I.B. Qualifications and expertise | 3 |
| I.C. Details of clinic operations..... | 4 |
| I.D. Parties | 6 |
| I.E. Meta’s alleged unfair and deceptive practices | 6 |
| I.F. Assignment and materials considered..... | 6 |
| II. Social media addiction is a serious concern acknowledged by mental health professionals that resembles other addiction disorders | 8 |
| III. Social media use is particularly problematic for teens and youth due to their underdeveloped brains..... | 14 |
| IV. Instagram is a primary contributor to teen and youth mental health concerns based on my clinical experience treating teens and youth with social media addiction | 16 |
| IV.A. Generalized clinic intake processes and initial consults..... | 16 |
| IV.B. Common parental concerns at intake..... | 17 |
| IV.C. Harms youth are facing from Instagram addiction | 18 |
| IV.D. Treatment strategies | 19 |
| V. Many Instagram features are harmful to teen and youth mental health, and Meta’s Teen Accounts are often ineffective at addressing those harms..... | 23 |
| Appendix A. Materials considered..... | A-1 |
| A.1. Legal and other case documents..... | A-1 |
| A.2. Books and academic papers | A-1 |
| A.3. Websites, articles, and press releases | A-5 |
| Appendix B. Curriculum vitae of Bradley Zicherman, MD | B-1 |

I. Introduction

I.A. Summary of opinions

- (1) **Social media addiction is a serious concern acknowledged by mental health professionals that resembles other addiction disorders and can be measured and diagnosed by adapting addiction criteria published by the American Psychiatric Association.** There have been countless research studies on the topic of social media addiction, and there are numerous validated tools for measurement of problematic social media use.
- (2) **Social media use is particularly problematic for teens and youth due to their underdeveloped brains.** It is well established that the brain does not fully develop until about the age of 25, with the prefrontal cortex—which is responsible for planning and impulse control—being the last structure to fully develop. Social media use is particularly problematic for teens and youth, as the variable reward system inherent in social media applications interacts with young users’ underdeveloped brains, resulting in increased impulsivity, risk taking, and emotional dysregulation. When children and adolescents use social media, it is as if they are pulling a slot machine lever, with social rewards in the form of likes, new posts, or targeted content triggering dopamine releases in the brain. This dopamine reinforcement motivates extended use and constant checking of the social media application due to the expectation of rewards.
- (3) **Instagram is a primary contributor to teen and youth mental health concerns based on my clinical experience treating teens and youth with social media addiction.** Youth with social media addiction concerns commonly have severe functional impairment, including changes in academic achievement and relationships with friends and family members. In my experience, these youth can easily bypass or disable blocks and restrictions embedded in social media apps or set by parents. These youth often use social media apps late into the evening, displacing sleep that is critical for adolescent development. Getting too little sleep is a known risk factor for the development of symptoms of depression and anxiety and can impair the prefrontal cortex, leading to riskier, more impulsive behavior. Though there are potential treatment options for social media addiction, treatment success rates are limited, demonstrating the need for prevention and early intervention.
- (4) **Many Instagram features are harmful to teen and youth mental health, and Meta’s Teen Accounts are often ineffective at addressing those harms.** While Instagram’s Teen Accounts are intended to provide built-in protections, in my experience, they are often ineffective, which nullifies any protection intended for youth and teens. The “gamification” of apps and systems inputs fun

elements into social media-based activities, resulting in reinforcing dopamine hits, which makes it difficult for youth to disengage from the apps.

I.B. Qualifications and expertise

- (5) My name is Bradley Zicherman, MD. I am a Clinical Associate Professor and Director of the Youth Recovery Clinic at Stanford University in Palo Alto, CA. Through this clinic, youth with addiction and mental health concerns are evaluated and treated. I have the title of medical director for the Quest intensive outpatient program (IOP) at El Camino Health, located in Mountain View, CA. The Quest program is a 12-week higher level of care option for youth who suffer from addiction and co-occurring mental health concerns and have typically not found success in a less intense level of outpatient treatment. I am also a treating psychiatrist at Alta Mira Recovery Center. Alta Mira is a residential treatment center specializing in the treatment of addiction disorders for adults.
- (6) I completed a 3-year general psychiatry residency at Texas Tech University Health Sciences Center. I also completed fellowships in Child and Adolescent Psychiatry at the University of South Florida (2 years), Addiction Psychiatry at the University of California San Francisco (1 year), and Forensic Psychiatry at Oregon Health Sciences University (1 year). I am board certified in General Psychiatry, Child and Adolescent Psychiatry, and Addiction Psychiatry.
- (7) I have provided a series of lectures on screen and social media addictions to Stanford psychiatry residents, addiction medicine fellows, and child and adolescent psychiatry fellows. I have provided several grand rounds lectures on the topic of youth digital screen addiction. At Stanford, I currently provide weekly supervision to a doctoral psychology student, who specifically requested supervision with me due to my expertise in youth and digital screen addiction.
- (8) I have engaged in frequent media appearances on topics relating to youth and social media addiction. I have provided live television commentary for CBS and FOX affiliates. I have been interviewed on NPR (National Public Radio) and quoted in publications such as the Washington Post on topics relating to youth and screen addictions. I have appeared on several podcasts discussing the topic of youth and screen addictions.
- (9) I have also provided numerous lectures and media appearances on the topic of youth and substance use. I provide a multi-part seminar series to Stanford Child and Adolescent Psychiatry fellows on these topics annually. I also provide in-service trainings to the clinic teams in the division of Child and Adolescent Psychiatry and have been a guest lecturer for Stanford University undergraduate seminars on the topic of youth and substance use. I have appeared on several podcasts regarding the topic of youth and substance use. I served as a consultant for the documentary “Fentanyl High” and

its associated study guide. I introduced the documentary at film screenings and participated in question-and-answer panels at the end of screenings.

- (10) My current research at Stanford is dedicated to the “Screen Sense” survey. I am the co-lead of this project. The survey is being designed and developed to capture digital media use among adolescents in outpatient child and adolescent psychiatry clinics. The survey will allow for quantitative and qualitative analysis of the patterns and frequency of digital media use, including social media use, in adolescents and transitional age youth (TAY; up to age 25) receiving treatment for a broad range of psychiatric disorders at the Stanford Department of Psychiatry and Behavioral Sciences’ Child and Adolescent Psychiatry outpatient clinics.
- (11) I am also an active member of the American Society of Addiction Medicine (ASAM) and the California Society of Addiction Medicine (CSAM). Through CSAM, I am a member of the Youth and Prevention Committee.
- (12) Appendix B contains a copy of my current CV and a list of all publications I have authored in the last 10 years. I have not previously testified as an expert at a trial or by deposition. I am being compensated at a rate of \$500 per hour for my work on this matter. None of my compensation is contingent upon the outcome of this litigation.

I.C. Details of clinic operations

- (13) I have evaluated and treated patients through the Stanford Youth Recovery Clinic since 2019.¹ I treat individuals up to the age of 25 who typically have “dual diagnosis” concerns. This is the term for individuals who have co-occurring addiction and mental health concerns. The addictions can be substance use or behavioral (such as social media addiction). I typically see four new patients per month through the Youth Recovery Clinic. Approximately 25–35 percent of my new intake requests are for technology addiction concerns. The most common form of technology addiction I am requested to evaluate is social media addiction. Of the patients presenting for intake due to substance use concerns, at least 50 percent of those individuals have concerning social media use habits that meet criteria for a technology addiction disorder. The Recovery Clinic offers several types of services, including individual psychotherapy and medication management services. Patients are typically seen on a weekly or biweekly basis after they initiate care. The Recovery Clinic has also offered seminars to parents of youth with technology addiction concerns. Patients seen through the Recovery Clinic at Stanford have a broad range of private insurance options as well as Medi-Cal, a public insurance program for low-income families.

¹ “Recovery Clinic,” Stanford Medicine, Division of Child and Adolescent Psychiatry and Child Development, accessed April 29, 2025, <https://med.stanford.edu/childpsychiatry/clinical/addiction.html>.

- (14) The Quest IOP at El Camino Health, where I have the title of medical director, is a dual diagnosis program for youth up to the age of 18.² This program is intended for youth whose clinical needs cannot be met in weekly or biweekly outpatient care and require a higher level of care. The program is three days a week for a total of nine hours per week. The program is 12–14 weeks. The Quest program initially focused primarily on youth with substance addictions. After seeing increasing numbers of youth presenting with technology addictions, the Quest program expanded its focus to admit these patients. Mixing youth with technology addictions and substance addictions into a combined milieu has worked well. The program curriculum is no different for those who have substance addictions and those who have social media addictions. At Quest, youth with technology addiction concerns work through a program that was designed for substance addictions but has also been found to be successful in treating technology addiction. This highlights the similarities in presentation and pathology that youth with substance addictions and those with technology addictions share. Upon successful completion of the Quest IOP, youth are often transferred back to services through the Stanford Youth Recovery Clinic.
- (15) In instances when youth with technology addictions continue to struggle with their technology use, these patients are considered for residential treatment center programs. Within the state of California, these are voluntary programs, often 30–90 days of treatment, where youth leave home and reside in treatment centers. Patients typically do not have exposure to any social media while residing at residential treatment. There is a lack of available adolescent residential addiction treatment centers in the country,³ and few programs offer treatment specifically tailored to technology or social media addiction.⁴ As discussed in more detail below, in my clinical experience and as discussed in the literature, the act of simply having a 30–90 day technology detox can have profound effects on mental health by resetting dopamine levels, even if treatment is not otherwise directly focused on the technology or social media use.⁵

² “ASPIRE,” El Camino Health, accessed April 29, 2025, <https://www.elcaminohealth.org/services/mental-health/specialty-programs/aspire>.

³ Caroline King, Tamara Beetham, Natasha Smith, Honora Englander, Dana Button, Patrick C M Brown, Scott E Hadland, Sarah M Bagley, Olivia Rae Wright, P Todd Korthuis, Ryan Cook, “Adolescent Residential Addiction Treatment In The US: Uneven Access, Waitlists, And High Costs,” *Health Aff (Millwood)* 43, no. 1 (2024): 64-71. “Residential Addiction Treatment for Adolescents is Scarce and Expensive,” National Institutes of Health, accessed May 14, 2025, <https://www.nih.gov/news-events/news-releases/residential-addiction-treatment-adolescents-scarce-expensive?utm>.

⁴ See, e.g., “Search Results: Internet Addiction, Residential, Adolescents,” Recovery.com, accessed May 14, 2025, <https://recovery.com/>. A search on Recovery.com for adolescent residential treatment centers for Internet Addiction conditions returns 78 centers in the United States, the vast majority of which do not appear to focus exclusively on youth or adolescents with technology addiction concerns.

⁵ Anna Lembke, “Dopamine Nation: Finding Balance in the Age of Indulgence,” *Penguin Publishing Group*, 2021: 77.

I.D. Parties

I.D.1. States

- (16) The plaintiffs in this lawsuit are a coalition of Attorneys General from 29 US states: Arizona, California, Colorado, Connecticut, Delaware, Hawai'i, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Nebraska, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Virginia, Washington, West Virginia, and Wisconsin (collectively, "Plaintiffs").

I.D.2. Meta

- (17) The defendants in this lawsuit are Meta Platforms, Inc.; Instagram, LLC; Meta Payments, Inc.; and Meta Platforms Technologies (collectively, "Meta").

I.E. Meta's alleged unfair and deceptive practices

- (18) It is my understanding that certain Plaintiffs allege that Meta "engaged in unfair and unconscionable acts and practices" and "deceptive acts and practices" "in connection with young users' use of and/or addiction to Meta's Social Media Platforms."⁶

I.F. Assignment and materials considered

- (19) I was retained by Plaintiffs to opine on the effects of excessive use of social media, including Instagram, and social media addiction on mental health-related symptoms based on my clinical expertise. I was also asked to opine on the effectiveness of current Meta platform restraints for youth, particularly under the age of 18; why social media addiction has been so difficult to treat; and which Instagram platform features are particularly harmful to youth mental health.
- (20) In reaching my opinions in this matter, I relied primarily on my clinical experiences treating youth with social media addictions. I also reviewed publicly available materials, including academic research studies, which are identified in Appendix A. In preparing this report, I was assisted by staff from the consulting firm Bates White. While engaged in this matter, I directed the activities of the team, made all final decisions, and prepared this report.

⁶ Complaint for Injunctive and Other Relief. *People of the State of California, et al. v. Meta Platforms, Inc., et al.* (N.D. Cal. Nos. 4:22-md-03047-YGR-PHK and 4:23-cv-05448-YGR) (November 22, 2023) [hereinafter "Complaint"], ¶¶ 847, 846.

Trial Report of Bradley Zicherman, MD

- (21) I reserve the right to update my opinions if new materials become available during the course of this litigation. I also reserve the right to employ demonstrative exhibits that summarize facts or opinions disclosed in this report and any subsequent depositions if I am called upon to testify at a hearing or trial.

II. Social media addiction is a serious concern acknowledged by mental health professionals that resembles other addiction disorders

- (22) The American Psychiatric Association (APA) defines the concept of “technology addiction” as “[e]xcessive and compulsive use of the internet or online activities [that] can lead to negative consequences in various aspects of an individual’s life. Technology addiction can potentially involve various forms of online activity including social media, gaming, gambling, problematic use of online pornography, and others.”⁷ Under the technology addiction umbrella, the APA also defines “social media addiction” as “problematic and compulsive use of social media; an obsessive need to check and update social media platforms, often resulting in problems in functioning and disrupted real-world relationships.”⁸ In the last two years, the APA has published a health advisory on social media use in adolescence and highlighted “a need for social media companies to make fundamental changes to their platforms” and “the need to enact new, responsible safety standards to mitigate harm.”⁹
- (23) The APA’s health advisory also recommends that “[a]dolescents should be routinely screened for signs of ‘problematic social media use’ that can impair their ability to engage in daily roles and routines, and may present risk for more serious psychological harms over time.”¹⁰ The advisory explains that “indicators of problematic social media use include:
- a tendency to use social media even when adolescents want to stop, or realize it is interfering with necessary tasks;
 - spending excessive effort to ensure continuous access to social media;
 - strong cravings to use social media, or disruptions in other activities from missing social media use too much;
 - repeatedly spending more time on social media than intended;
 - lying or deceptive behavior to retain access to social media use; and

⁷ “What is Technology Addiction?” American Psychiatric Association, accessed April 29, 2025, <https://www.psychiatry.org/patients-families/technology-addictions-social-media-and-more/what-is-technology-addiction>.

⁸ “What is Technology Addiction?” American Psychiatric Association, accessed April 29, 2025, <https://www.psychiatry.org/patients-families/technology-addictions-social-media-and-more/what-is-technology-addiction>.

⁹ “Potential Risks of Content, Features, and Functions: The Science of How Social Media Affects Youth,” American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/youth-social-media-2024>.

¹⁰ “Health Advisory on Social Media Use in Adolescence,” American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/health-advisory-adolescent-social-media-use>.

- loss or disruption of significant relationships or educational opportunities because of social media use.”¹¹

- (24) There have been countless research studies on the topic of social media addiction,¹² and there are numerous validated tools for the measurement of problematic social media use.¹³ A PubMed search query for “social media addiction” returns a result of over 10,000 research articles.¹⁴ A PubMed search query for “social media addiction measurement tool” returns a result of over 300 research articles.¹⁵ For my own research, I have relied on a screen usage assessment validated through the Adolescent Brain Cognitive Development (ABCD) study.¹⁶ The ABCD screen usage assessment consists of multiple separate surveys to capture different domains of screen usage. The different surveys I have adapted in my research include the Screen Usage Questionnaire, Sleep and Screen Usage Questionnaire, Mobile Phone Usage Questionnaire, Social Media Addiction Questionnaire, and the Video Game Addiction Questionnaire.
- (25) Despite the APA’s and researchers’ acknowledgement of the concerns regarding technology addiction and more specifically, social media addiction, they have not yet been officially recognized as disorders within the APA’s Diagnostic and Statistical Manual of Mental Disorders (DSM). The DSM

¹¹ “Health Advisory on Social Media Use in Adolescence,” American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/health-advisory-adolescent-social-media-use>.

¹² See, e.g., Alfonso Pellegrino, Alessandro Stasi, and Veera Bhatiasavi, “Research Trends in Social Media Addiction and Problematic Social Media Use: A Bibliometric Analysis,” *Frontiers in Psychiatry* 13 (2022): 1017506. Daria Kuss and Mark D. Griffiths, “Online Social Networking and Addiction—A Review of the Psychological Literature,” *International Journal of Environmental Research and Public Health* 8, no. 9 (2011): 3528–3552. Maria Chiara D’Arienzo, Valentina Boursier, and Mark D. Griffiths, “Addiction to Social Media and Attachment Styles: A Systematic Literature Review,” *International Journal of Mental Health and Addiction* 17 (2019): 1094–1118. Mark Griffiths, Daria Kuss, and Zsolt Demetrovics, “Social Networking Addiction: An Overview of Preliminary Findings,” *Behavioral Addictions* (2014): 119–141.

¹³ See, e.g., Sarah Domoff, Kristen Harrison, Ashley N. Gearhardt, Douglas A. Gentile, Julie C. Lumeng, and Alison L. Miller, “Development and Validation of the Problematic Media Use Measure: A Parent Report Measure of Screen Media ‘Addiction’ in Children,” *Psychology of Popular Media Culture* 8, no. 1 (2019): 2–11. Oriana Perez, Tatyana Garza, Olivia Hinder, Alicia Beltran, Salma M. Musaad, Tracey Dibbs, Anu Singh et al, “Validated Assessment Tools for Screen Media Use: A Systematic Review,” *PLOS One* 18, no. 4 (2023): 0283714. Ilaria Cataldo, Joël Billieux, Gianluca Esposito, and Ornella Corazza, “Assessing Problematic Use of Social Media: Where Do We Stand and What Can Be Improved?” *Current Opinion in Behavioral Sciences* 45 (2022): 101145. D. Hipp, E. C. Blakley, N. Hipp, P. Gerhardstein, B. Kennedy, and Tracy Markle, “The Digital Media Overuse Scale (dMOS): A Modular and Extendible Questionnaire for Indexing Digital Media Overuse,” *Technology, Mind, and Behavior*, 4 (3: Fall 2023).

¹⁴ “Search Results: Social Media Addiction,” Stanford Medicine Lane Medical Library, accessed May 8, 2025, <https://lane.stanford.edu/search.html?q=social+media+addiction&source=all-all&facets=recordType%3A%22pubmed%22>. The search returns more than 2,000 research articles when searching for the exact phrase “social media addiction,” <https://lane.stanford.edu/search.html?q=%22social+media+addiction%22&source=all-all&facets=recordType%3A%22pubmed%22>.

¹⁵ “Search Results: Social Media Addiction Measurement Tool,” Stanford Medicine Lane Medical Library, accessed May 8, 2025, <https://lane.stanford.edu/search.html?q=social+media+addiction+measurement+tool&source=all-all&facets=recordType%3A%22pubmed%22>.

¹⁶ Jason M. Nagata, Christopher M. Lee, Jacqueline O. Hur, and Fiona C. Baker, “What We Know About Screen Time and Social Media in Early Adolescence: A Review of Findings From the Adolescent Brain Cognitive Development Study,” *Current Opinion in Pediatrics* (2025): 1–8.

is a standardized classification of mental disorders used by mental health professionals in the United States. The current edition is the DSM-V, published in 2013.¹⁷ Social media was only in its infancy at the time of the DSM-V release. Meta acquired Instagram in 2012,¹⁸ just one year prior to the latest DSM release. However, the DSM-V does list Internet Gaming disorder as a condition warranting further study.¹⁹ In my professional opinion, although the DSM-VI has an unknown release date, it is likely that the DSM-VI will have new official diagnoses for various technology addictions.

- (26) While there may not be an official DSM-V diagnosis for technology addictions including social media addiction at this time, based on the fact that there is a significant body of research to date,²⁰ and based on my own clinical work experience, I believe it is appropriate and necessary to consider technology addictions in line with and similar to other addiction disorders listed in the DSM-V. In my professional experience, I believe social media addiction resembles other previously established behavioral addiction disorders and substance addiction disorders. Therefore, I believe it is appropriate to extrapolate from the established DSM criteria for addiction disorders as outlined below to determine whether a patient suffers from a social media addiction.²¹
- (27) In this context, it is also important to note that the World Health Organization's International Statistical Classification of Diseases and Related Health Problems (ICD) has a diagnostic code for Gaming disorder (6C51) and a diagnostic code for Other Specified disorder due to addictive behaviors (6C5Y). Research has supported the inclusion of problematic use of the internet for activities such as social media within this latter diagnostic code.²² Psychiatric treatment in the United

¹⁷ American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013. A revised version of the DSM-V was published in 2022 (DSM-5-TR). American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision. Washington, DC, American Psychiatric Association, 2022. *See also* "Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)," American Psychiatric Association, accessed April 29, 2025, <https://www.psychiatry.org/psychiatrists/practice/dsm>.

¹⁸ "Facebook to Acquire Instagram," Meta Newsroom, April 9, 2012, <https://about.fb.com/news/2012/04/facebook-to-acquire-instagram/>.

¹⁹ American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013: Section III: Conditions for Further Study.

²⁰ *See, e.g.*, Mohamed Basel Almourad, John McAlaney, Tiffany Skinner, Megan Pleya, and Raian Ali, "Defining Digital Addiction: Key Features From the Literature," *Psihologija* 53, no. 3 (2020): 237–253. Kerstin Paschke, Maria Isabella Austermann, and Rainer Thomasius, "ICD-11-Based Assessment of Social Media Use Disorder in Adolescents: Development and Validation of the Social Media Use Disorder Scale for Adolescents," *Frontiers in Psychiatry* 12 (2021): 661483. Tania Moretta and Elisa Wegmann, "Toward the Classification of Social Media Use Disorder: Clinical Characterization and Proposed Diagnostic Criteria," *Addictive Behaviors Reports* 21 (2025): 100603.

²¹ Kerstin Paschke, Maria Isabella Austermann, and Rainer Thomasius, "ICD-11-Based Assessment of Social Media Use Disorder in Adolescents: Development and Validation of the Social Media Use Disorder Scale for Adolescents," *Frontiers in Psychiatry* 12 (2021): 661483. Tania Moretta and Elisa Wegmann, "Toward the Classification of Social Media Use Disorder: Clinical Characterization and Proposed Diagnostic Criteria," *Addictive Behaviors Reports* 21 (2025): 100603.

²² Matthias Brand, Hans-Jürgen Rumpf, Zsolt Demetrovics, Astrid Müller, Rudolf Stark, Daniel L. King, Anna E. Goudriaan et al, "Which Conditions Should be Considered as Disorders in the International Classification of Diseases (ICD-11) Designation of "Other Specified Disorders Due to Addictive Behaviors" *Journal of Behavioral Addictions* 11, no. 2 (2022): 150–159.

States does not typically bill ICD codes, but this a recognized global standard maintained by the WHO that “provides critical knowledge on the extent, causes and consequences of human disease and death worldwide.”²³

- (28) The DSM proposed the following criteria for Internet Gaming disorder (IGD): A person must experience significant impairment or distress and meet at least five of the following nine criteria within a 12-month period.²⁴
1. Preoccupation – Constantly thinking about gaming or previous gaming experiences.
 2. Withdrawal Symptoms – Irritability, anxiety, or sadness when unable to play.
 3. Tolerance – Needing to play more over time to get the same satisfaction.
 4. Loss of Control – Unsuccessful attempts to cut back or stop gaming.
 5. Loss of Interest in Other Activities – Reduced participation in hobbies or social activities.
 6. Continued Use Despite Problems – Playing despite knowing it causes problems (e.g., with school, work, or relationships).
 7. Deception – Lying about the amount of time spent gaming.
 8. Use as an Escape – Using gaming to escape negative emotions (e.g., stress, anxiety, depression).
 9. Jeopardized Relationships or Opportunities – Risking or losing significant relationships, jobs, or academic opportunities due to gaming.
- (29) The following are the DSM criteria for substance use disorders.²⁵ To be diagnosed, a person must meet at least two of the following 11 criteria within a 12-month period.
1. Taking the substance in larger amounts or for longer than intended.
 2. Persistent desire or unsuccessful efforts to cut down or control use.
 3. Spending a lot of time obtaining, using, or recovering from the substance.
 4. Craving or strong urge to use the substance.
 5. Failure to fulfill major role obligations at work, school, or home due to substance use.
 6. Continued use despite social or interpersonal problems caused by substance use.

²³ “International Statistical Classification of Diseases and Related Health Problems (ICD),” World Health Organization, accessed April 29, 2025, <https://www.who.int/standards/classifications/classification-of-diseases>.

²⁴ American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013: 795.

²⁵ American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013: 483–484.

7. Giving up or reducing important social, occupational, or recreational activities due to substance use.
8. Recurrent use in physically hazardous situations (e.g., driving under the influence).
9. Continued use despite knowing it causes or worsens physical or psychological problems.
10. Tolerance (needing more of the substance for the same effect or reduced effect with the same amount).
11. Withdrawal (experiencing withdrawal symptoms or using the substance to relieve withdrawal).

(30) Severity Levels pursuant to the DSM criteria for substance use disorders are as follows:

- **Mild:** 2–3 criteria
- **Moderate:** 4–5 criteria
- **Severe:** 6+ criteria

(31) The proposed criteria for IGD and the established criteria for substance use disorders are quite similar. In my opinion, either set of criteria is appropriate to use when considering evaluation of a patient with technology use concerns. I believe the proposed criteria for IGD is limited by the lack of proposed severity levels. My own professional preference is to adapt the criteria for substance use disorder, and substitute the word technology, social media, or video game, for the abused substance.

(32) If considering social media addiction, the DSM-V criteria would be adapted as follows:

1. Using social media in larger amounts or for longer than intended.
2. Persistent desire or unsuccessful efforts to cut down or control use.
3. Spending a lot of time obtaining, using, or recovering from social media use.
4. Craving or strong urge to use social media.
5. Failure to fulfill major role obligations at work, school, or home due to social media use.
6. Continued use despite social or interpersonal problems caused by social media use.
7. Giving up or reducing important social, occupational, or recreational activities due to social media use.
8. Recurrent use in physically hazardous situations (e.g., driving while using social media, “viral” challenges or attempting dangerous stunts or pranks to be captured on social media, real-life meet ups with strangers that a child or teen may meet through social media).
9. Continued use despite knowing it causes or worsens physical or psychological problems.

10. Tolerance (needing more use of social media for the same effect or reduced effect with the same amount).

11. Withdrawal (experiencing withdrawal symptoms or using social media to relieve withdrawal).

(33) The Severity Levels would be unchanged:

- **Mild:** 2–3 criteria
- **Moderate:** 4–5 criteria
- **Severe:** 6+ criteria

(34) In my professional experience working with patients with technology addiction concerns and more specifically, social media addiction concerns, I believe it is appropriate to consider an addiction disorder diagnosis if at least 2 of the 11 above criteria are met. I estimate that over 50 percent of patients I have clinically evaluated for social media addiction meet severe use disorder criteria, based on the above model.

III. Social media use is particularly problematic for teens and youth due to their underdeveloped brains

- (35) It is well established through research that the brain does not fully develop until the age of 25 in most individuals.²⁶ The last structure in the brain to fully develop is the prefrontal cortex. The prefrontal cortex is responsible for executive functioning: the ability to support goal-directed behavior through cognitive control. In other words, the prefrontal cortex underlies the ability to plan, focus attention, juggle tasks, prioritize appropriately, and control impulses.²⁷ Adolescence is a time when the executive function boundaries are tested. It is notoriously a time of risk-taking behaviors, substance use experimentation, and rebelling against authority.²⁸ The sub-optimal reasoning and decision making of an adolescent is a result of their stage of cognitive development and is largely influenced by the lag time in development of the prefrontal cortex.²⁹ While it may be expected that adolescents act in similar ways to adults, the prefrontal cortex of an adolescent and adult brain remain quite different. The adolescent prefrontal cortex has not yet undergone synaptic pruning and full myelination, two processes that help to improve cognition, reduce impulsivity and risk-taking, and promote emotional regulation.³⁰ The prefrontal cortex of an adolescent brain ultimately looks quite different through MRI and other imaging modalities compared to the prefrontal cortex of an adult.³¹
- (36) Dopamine is a neurotransmitter considered to be at the core of the brain's reward system, determining the reward value of experiences such as food, sex, and social interactions.³² Upon exposure to rewarding stimuli, the mesolimbic system releases dopamine into specific target nuclei.³³ Evidence suggests that a shared mechanism in the brain underlies all addictions, whether substance-related or

²⁶ Mariam Arain, Maliha Haque, Lina Johal, Puja Mathur, Wynand Nel, Afsha Rais, Ranbir Sandhu, and Sushil Sharma, "Maturation of the Adolescent Brain," *Neuropsychiatric Disease and Treatment* 9 (2013): 449–461.

²⁷ Mariam Arain, Maliha Haque, Lina Johal, Puja Mathur, Wynand Nel, Afsha Rais, Ranbir Sandhu, and Sushil Sharma, "Maturation of the Adolescent Brain," *Neuropsychiatric Disease and Treatment* 9 (2013): 449–461. Naomi Friedman and Trevor Robbins, "The Role of Prefrontal Cortex in Cognitive Control and Executive Function," *Neuropsychopharmacology* 47, no. 1 (2022): 72–89. Earl Miller, and Jonathan Cohen, "An Integrative Theory of Prefrontal Cortex Function," *Annual Review of Neuroscience* 24, no. 1 (2001): 167–202. Adele Diamond, "Executive Functions," *Annual Review of Psychology* 64, no. 1 (2013): 135–168.

²⁸ Laurence Steinberg, "A Social Neuroscience Perspective on Adolescent Risk-taking," *Developmental Review* 28, no. 1 (2008): 78–106. B.J. Casey and Kristina Caudle, "The Teenage Brain: Self Control," *Current Directions in Psychological Science* 22, no. 2 (2013): 82–87.

²⁹ Laurence Steinberg, "Cognitive and Affective Development in Adolescence," *Trends in Cognitive Sciences* 9, no. 2 (2005): 69–74. Sarah-Jayne Blakemore, "Imaging Brain Development: The Adolescent Brain," *NeuroImage* 61, no. 2 (2012): 397–406.

³⁰ Linda Patia Spear, "Adolescent Neurodevelopment," *Journal of Adolescent Health* 52, no. 2 (2013): S7–S13.

³¹ B.J. Casey, Rebecca Jones, and Todd Hare, "The Adolescent Brain," *Annals of the New York Academy of Sciences* 1124 (2008): 111–126.

³² Robert G. Lewis, Ermanno Florio, Daniela Punzo, and Emiliana Borrelli, "The Brain's Reward System in Health and Disease," *Circadian Clock in Brain Health and Disease: Advances in Experimental Medicine and Biology*, vol 1344. Springer, 2021: 57–69.

³³ Debasmita De, Mazen El Jamal, Eda Aydemir, and Anika Khera, "Social Media Algorithms and Teen Addiction: Neurophysiological Impact and Ethical Considerations," *Cureus* 17, no. 1 (2025).

behavioral such as social media addiction.³⁴ Social media applications impact this system by increasing dopamine release via digital footprints and machine learning algorithms that flash personalized content. This reinforcement motivates extended use and constant checking of the social media application due to the expectation of rewards.³⁵ When children and adolescents access their social media accounts, it is as if they are pulling a slot machine lever. They do not know when they check a social media account if there will be a new post, a new like, a new subscriber/follower, or targeted content that will trigger that dopamine release. In my clinical opinion, children and adolescents are victims of this endless dopamine feedback cycle, induced by endless social media feeds, seeking and anticipating rewards in the way of photo tagging, likes, and comments.

- (37) Given the significant ways in which the prefrontal cortex of an adolescent brain differs from the prefrontal cortex of an adult brain, the potential risk of using social media platforms such as Instagram are more severe for adolescents than adults. In my clinical opinion, the social media use habits of a 13-year-old are far more problematic than the social media use habits of a 25-year-old with a fully developed prefrontal cortex. Clinically, these younger patients are more likely to develop a social media addiction, and also seem far more likely to be impacted by risky content once exposed to it (illicit drugs, sexual content, eating disorders, etc.) In my work with adults above the age of 25, concerns about the possibility of a social media addiction are far less common compared to my work with individuals under the age of 25. An individual over the age of 25 is likely to have a developed sense of identity, self-esteem, and coping skills, providing resiliency and mitigating at least some of the negative effects of social media. Research studies also support the idea that social media addictions are far more prevalent in younger individuals.³⁶ In a Statista survey asking individuals if they feel addicted to social media, 40% of US responders aged 18–22 reported feeling addicted to social media.³⁷

³⁴ Eric J. Nestler, “Is There a Common Molecular Pathway for Addiction?” *Nature Neuroscience* 8, no. 11 (2005): 1445–1449.

³⁵ Alejandro L. Mujica, Charles R. Crowell, Michael A. Villano, and Khutb M. Uddin, “Addiction By Design: Some Dimensions and Challenges of Excessive Social Media Use,” *Medical Research Archives* 10, no. 2 (2022): 1–29.

³⁶ Zara Abrams, “Why Young Brains are Especially Vulnerable to Social Media,” American Psychological Association, August 3, 2023, <https://www.apa.org/news/apa/2022/social-media-children-teens>. Daria Kuss and Mark D. Griffiths, “Online Social Networking and Addiction—A Review of the Psychological Literature,” *International Journal of Environmental Research and Public Health* 8, no. 9 (2011): 3528–3552.

³⁷ “Share of Online Users in the United States Who Report Being Addicted to Social Media as of April 2019, by Age Group,” Statista, August 2019, <https://www.statista.com/statistics/1081292/social-media-addiction-by-age-usa/>.

IV. Instagram is a primary contributor to teen and youth mental health concerns based on my clinical experience treating teens and youth with social media addiction

IV.A. Generalized clinic intake processes and initial consults

- (38) My clinical experience within the Stanford Youth Recovery Clinic involves several pathways leading to evaluation and treatment of youth with social media addiction concerns. The most common pathway is through self-referral by parents (approximately 75% of new patients). Parents either call the clinic requesting an evaluation or they fill out an online referral form. Parents of youth are then scheduled for a brief phone screen in which the screener elicits the parental concerns in more detail. Cases are then brought up at a clinic disposition meeting. Any cases deemed appropriate for the Recovery Clinic due to social media addiction concerns mentioned during phone screens are sent to me for clinical review and typically scheduled into a new patient time slot. Due to the high volume of referrals within the Stanford system, not all new referrals are guaranteed further treatment services. However, as a result of the high level of severity of most cases presenting for social media addictions, those patients typically remain in the clinic for on-going treatment.
- (39) In almost every self-referral for social media addiction, it is the parent of the adolescent contacting the clinic, not the adolescent themselves. In these cases, the youth rarely believe they have a problem with social media use. In my clinical experience, it is rare for the adolescents themselves to believe there is a problem with their social media use, or that their social media use requires intervention. In my clinical experience, adolescents presenting for social media addiction concerns rarely recognize the emotional, behavioral, or functional impairments derived from their social media use. I believe this lack of insight is attributable to the underdeveloped prefrontal cortex of the adolescent brain. This presents a substantial barrier to treatment engagement and highlights the tremendous challenge of working with youth with social media addictions. It typically requires an incredible amount of time and effort just to change a youth's mindset from being pre-contemplative about a possible addiction problem, to actually considering and implementing change.
- (40) Another important source of referrals is clinicians within Stanford Psychiatry Clinics or Stanford Pediatrics. In my clinical experience, very few psychiatrists feel well equipped to deal with the complexities involving patients with social media addictions or parents with social media concerns. Often patients go through the Stanford Psychiatry pre-admission screening process and then are sent to other clinics such as the Mood Clinic, Anxiety Clinic, or Early Psychosis Clinic, until it is determined that there is a serious social media addiction issue that is better suited for Recovery Clinic services. In my experience, many treatment facilities have difficulty in processing, treating, and evaluating social media addicted patients due to a lack of funding and clinical resources. I am often

contacted by parents in the community, who are surprised that our program exists, and wish they had known about help sooner.

- (41) The El Camino Health Quest IOP is recognized in the region for its addiction treatment services.³⁸ Families typically contact the program, have a thorough pre-admission screen, and are then approved for the program if appropriate. Approximately 10–20 percent of referrals are for screen addiction concerns. Of those presenting with substance addiction concerns, at least half of those patients have concerning social media use habits. At this program, youth with social media concerns are in a mixed milieu with patients having substance addiction issues. This tends to be a population with significant behavioral challenges relating to their social media use. The hope is that youth in the program can successfully complete the 12-week program and then potentially transition to Stanford Youth Recovery Clinic services.
- (42) The Recovery Clinic and Quest program are considered dual diagnosis focused, meaning patients typically present with addiction and co-occurring mental health concerns. In the case of youth presenting with social media addiction concerns, co-occurring insomnia, depression, anxiety, PTSD, or eating disorder concerns are common.³⁹ Parents will typically detail these concerns at the pre-admission screen and at the time of actual evaluation. Often, parents relate that their child has had attempts at treatment for these co-occurring mental health concerns, however, the addiction component was not directly addressed at all. As I describe in Section IV.D, it is my experience that directly addressing and treating the primary social media addiction often results in a significant improvement and remission of the co-occurring mental health concern, suggesting that social media addiction is a primary contributor to other mental health concerns.

IV.B. Common parental concerns at intake

- (43) Parent complaints about their child's social media addiction often have similar concerning characteristics and follow a spectrum of presentations across my experiences at the Recovery Clinic and the Quest IOP program. When parents initially meet as part of the Recovery Clinic or the Quest IOP program, they are often desperate and express how critical their situation at home has become. Parents will express having zero control over their child's social media use, and detail how it has become a dominant influence in their family dynamics. Parents detail how attempts at restrictions

³⁸ "ASPIRE," El Camino Health, accessed April 29, 2025, <https://www.elcaminohealth.org/services/mental-health/specialty-programs/aspire>.

³⁹ Yvonne Kelly, Afshin Zilanawala, Cara Booker, Amanda Sacker, "Social Media Use and Adolescent Mental Health: Findings From the UK Millennium Cohort Study," *eClinicalMedicine*, vol 6 (2018): 59–68. Faisal A. Nawaz, Mehr Muhammad Adeel Riaz, Nimrat ul ain Banday, Aakanksha Singh, Zara Arshad, Hanan Derby, Meshal A. Sultan, "Social Media Use Among Adolescents With Eating Disorders: A Double-edged Sword," *Frontiers in Psychiatry*, 15 (2024): 1300182. Alexandra Dane, Komal Bhatia, "The Social Media Diet: A Scoping Review to Investigate the Association Between Social Media, Body Image and Eating Disorders Amongst Young People," *PLOS Global Public Health*, no 3 (2023): e0001091.

have been met with severe physical and verbal outbursts. Families often inform me that they have had to involve police and that their child will verbalize suicidal or homicidal thoughts or attempt to run away from home if there is an attempt to set limits regarding social media use. These parents express that they feel defeated and powerless.

- (44) When parents access services through the Recovery Clinic or Quest, they have typically reached a point where they feel they have no control over their child's social media use after exhausting measures to limit use such as phone app blockers. Parents will provide examples of their children easily bypassing or disabling blocks that they have placed on social media apps, including Instagram, and the ease of access to these social media platforms. Parents will also detail how their child will access social media platforms on school-provided tablets and other devices besides their personal smartphone, without parental knowledge, in an attempt to hide their social media use. Sometimes parents report concerns that their child may be involved in theft of devices from schools and stores in order to access social media without parental knowledge, in a similar fashion to reports I receive from parents of teens with substance abuse concerns involved with theft of substances to fuel their addiction.

IV.C. Harms youth are facing from Instagram addiction

- (45) When youth present for initial evaluation in the Recovery Clinic or Quest IOP due to social media addiction concerns, severe functional impairment is commonly reported by their parents. There are often reports of changes in academic achievement and relationships with friends and family members. Parents will report a shift in their child's priorities, with social media use taking priority over responsibilities to school or family. Youth will express reluctance to engage in family events, family meals, or chores around the home, as it interferes with their social media use time. Parents will describe an increasing amount of isolation of their child and that social media use is the only activity their child wants to engage in. Parents will detail that their child wants to remain in their room while using social media. Parents will share concerns that their child is accessing pornographic content and using the Instagram platform to find drug dealers. I have seen students having a precipitous drop in GPA, students with a history of excellent attendance now missing school, and reports from school of students having a shift in focus or being caught using social media while in the classroom. Parents will ultimately relate that they believe social media is a primary driver of the functional changes and impairments they have been witnessing in their child.
- (46) When parents report challenges managing their child's social media use habits, bedtime habits and routines are typically described with great concern. Parents will often express that their child is unwilling to go to bed without their phone. In these situations, parents report that their child will use social media until late hours in the evening, with the child getting little sleep before school. As a result of their child's late-hour social media use, they are often unable to participate in school or

engage in family activities and responsibilities. Failure for children and teenagers to get enough sleep is a known risk factor for the development of symptoms of depression and anxiety.⁴⁰ Without enough sleep, children and teenagers are more likely to appear moody or irritable and have challenges regulating their emotions. Lack of sleep also impairs the prefrontal cortex, which means a child or teen failing to get appropriate hours of sleep may engage in riskier, more impulsive behavior.⁴¹ The APA's "Health advisory on social media use in adolescence" notes that "technology use particularly within one hour of bedtime, and social media use in particular, is associated with sleep disruptions. Insufficient sleep is associated with disruptions to neurological development in adolescent brains, teens' emotional functioning, and risk for suicide."⁴²

IV.D. Treatment strategies

- (47) First and foremost, when working with youth with any form of addiction, it is important to try to build a strong rapport and ensure confidentiality. In my experience, if a youth has any sense that what they report in a clinical interview could be disclosed to parents or records could be released, treatment success rates will be very low, and the youth will be reluctant to ever return to the clinic.
- (48) There are several evidence-based treatment approaches that I utilize when working with youth with social media addictions. These primarily include motivational interviewing, cognitive behavioral therapy (CBT), and family-focused therapy. CBT is one of the most well-studied evidence-based psychotherapy interventions, including a study on the effectiveness of CBT for treating problematic social media use.⁴³ CBT focuses on identifying and changing negative thought patterns and behavior, and it can be tailored to a variety of mental health concerns. I have found it particularly helpful when working with youth with social media addiction concerns.
- (49) Motivational interviewing is an evidence-based approach to working with patients with substance addictions, developed in the early 1980s. Motivational interviewing is readily adapted to working with patients with technology addictions, and high-quality studies exist demonstrating its efficacy for technology addictions.⁴⁴ Motivational interviewing can be defined as a particular way of talking with

⁴⁰ Ruthann Richter, "Among Teens, Sleep Deprivation an Epidemic," Stanford Medicine News Center, October 8, 2015, <https://med.stanford.edu/news/all-news/2015/10/among-teens-sleep-deprivation-an-epidemic.html>. Robert E. Roberts, Catherine Ramsay Roberts, and Hao T. Duong, "Sleepless in Adolescence: Prospective Data on Sleep Deprivation, Health and Functioning," *Journal of Adolescence* 32, no. 5 (2009): 1045–1057.

⁴¹ Eva H. Telzer, Andrew J. Fuligni, Matthew D. Lieberman, and Adriana Galván, "The Effects of Poor Quality Sleep on Brain Function and Risk Taking in Adolescence," *NeuroImage* 71 (2013): 275–283.

⁴² "Health Advisory on Social Media Use in Adolescence," American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/health-advisory-adolescent-social-media-use>.

⁴³ Xingchen Zhou, Pei-Luen Patrick Rau, Chi-Lan Yang, and Xiaofei Zhou, "Cognitive Behavioral Therapy-Based Short-Term Abstinence Intervention for Problematic Social Media Use: Improved Well-Being and Underlying Mechanisms," *Psychiatric Quarterly* 92 (2021): 761–779.

⁴⁴ Jan Dieris-Hirche, Laura Bottel, Magdalena Pape, Bert Theodor Te Wildt, Klaus Wölfling, Peter Henningsen, Nina

people about change and growth to strengthen their own motivation and commitment. Motivational interviewing attempts to empower patients to effect their own change as opposed to the clinician bluntly stating what changes need to happen and trying to solve a patient's problem for them. In my clinical opinion, motivational interviewing provides the core foundations of working clinically with any patient dealing with an addiction. I believe it is a critical tool for working with youth with social media addictions.

- (50) Any attempts at addressing and changing problematic social media addiction in youth, in my clinical opinion, have to involve working with the family system at large. I often have plenty of meetings that are only with the parents of a patient with social media addiction concerns or dedicate a significant amount of time with the parents of such a patient. Parents often come to the clinic wanting quick fixes and immediate solutions, yet social media addiction in youth, in my opinion, can be so powerful and consuming that it takes many visits over the course of at least months to develop substantial change. Expectation setting is an important piece of working with these families, as is getting parents to model desired behavior. If a parent wants their child to limit their social media use, it is important for the parent to also demonstrate good social media use habits for their children. In my clinical experience, this has been a frequent barrier to treatment success. I will work with parents who would like their child to change their social media use habits yet are not willing to make changes themselves.
- (51) Resistance to treatment and getting youth to understand they have a problem with their social media use, in my opinion, has been more challenging than working with youth with substance addictions. I find it easier to treat a fentanyl addiction than social media addiction. At least with a fentanyl-addicted patient, there are medications that can be utilized to counteract the addiction on the biological level with a strong evidence base.⁴⁵ No such options exist for social media addictions.
- (52) The act of simply having a 30–90 day social media detox as part of residential treatment can have profound effects, even if treatment is not otherwise directly focused on social media use.⁴⁶ Anna

Timmesfeld et al, "Effects of an Online-based Motivational Intervention to Reduce Problematic Internet Use and Promote Treatment Motivation in Internet Gaming Disorder and Internet Use Disorder (OMPRIS): Study Protocol for a Randomised Controlled Trial," *BMJ open* 11, no. 8 (2021): e045840. Jessica Ballesteros-Holmes, Malinda Teague, and Anne Derouin, "Decreasing Social Media Use Through Motivational Interviewing: A Pediatric Primary Care Quality Improvement Project," *Journal of Pediatric Health Care* 38, no. 6 (2024): 903–911. Mereerat Manwong, Vitool Lohsoonthorn, Thanvaruj Booranasuksakul, and Anun Chaikoolvatana, "Effects of a Group Activity-based Motivational Enhancement Therapy Program on Social Media Addictive Behaviors Among Junior High School Students in Thailand: A Cluster Randomized Trial," *Psychology Research and Behavior Management* (2018): 329–339.

⁴⁵ "Naloxone DrugFacts," National Institute on Drug Abuse, accessed April 29, 2025, <https://nida.nih.gov/publications/drugfacts/naloxone>. "Buprenorphine," Substance Abuse and Mental Health Services Administration, accessed April 29, 2025, <https://www.samhsa.gov/substance-use/treatment/options/buprenorphine>. "Naltrexone," Substance Abuse and Mental Health Services Administration, accessed April 29, 2025, <https://www.samhsa.gov/substance-use/treatment/options/naltrexone>.

⁴⁶ Paige Coyne and Sarah J. Woodruff, "Taking a Break: The Effects of Partaking in a Two-Week Social Media Digital Detox on Problematic Smartphone and Social Media Use, and Other Health-Related Outcomes among Young

Lembke, MD, in *Dopamine Nation* writes, “Abstinence is necessary to restore homeostasis, and with it our ability to get pleasure from less potent rewards. Fasting from dopamine allows sufficient time for the gremlins to hop off the balance to go back to the level position.”⁴⁷ In my professional experience, digital detox through residential treatment allows youth to develop other activities and interests and allows for a reset of family media planning and use. After successful completion of residential treatment, youth will often re-transition to the Quest IOP or the Stanford Youth Recovery Clinic. Residential treatment was designed to treat patients with the most complex, severe, and debilitating mental health and substance use disorders. Living 30–90 days away from home can be incredibly disruptive to family, school, and social obligations, yet it has become a necessary intervention for so many youth with social media addiction concerns.

- (53) It is my opinion, working closely with these patients and their parents, that social media addiction is often a primary contributor of co-occurring mental health problems such as insomnia, depression, anxiety, PTSD, or eating disorder concerns. In my experience working with this patient population, directly addressing and treating the primary social media addiction typically results in a significant improvement and remission of the co-occurring mental health concerns. Once the social media addiction concerns are resolved through psychotherapeutic interventions, I find that there often is no further indication for medications aimed at treating depression or anxiety concerns that were co-occurring at the time.
- (54) I have found that using pharmacotherapy approaches to treat depression and anxiety in patients with social media addiction often has limited utility, despite the success of pharmacotherapy for depression and anxiety in other populations. Selective Serotonin Re-uptake Inhibitors (SSRIs) such as Prozac, Zoloft, and Lexapro are the most rigorously tested and first line medication options for youth with depression or anxiety disorders.⁴⁸ Yet, when utilizing these medications in youth with social media addiction and co-occurring depression or anxiety, I typically find that treatment success rates with psychotherapeutic approaches targeting the addiction alone are equal to success rates when pharmacotherapy options are added to treatment, further supporting the notion that social media use in youth is a primary contributor to depression and anxiety. Also supporting the notion that social media use in youth is a primary contributor to mental health disorders is the fact that parents will report that changes in mood, anxiety, and development of abnormal sleeping patterns in their children coincided with the onset of regular social media engagement. Even if, in some cases, it is difficult to determine whether a patient’s social media addiction or depression developed first, the act of directly

Adults,” *Behavioral Sciences* 13, no. 12 (2023): 1004. Melissa Hunt, Rachel Marx, Courtney Lipson, and Jordyn Young, “No More FOMO: Limiting Social Media Decreases Loneliness and Depression,” *Journal of Social and Clinical Psychology* 37, no. 10 (2018): 751–768. Nasha Addarich Martínez, “Rest and Recharge with These Tips for Social Media Detoxing,” CNET, March 4, 2025, <https://www.cnet.com/health/mental/rest-and-recharge-with-these-tips-for-social-media-detoxing/>.

⁴⁷ Anna Lembke, *Dopamine Nation: Finding Balance in the Age of Indulgence*, Penguin Publishing Group, 2021: 77.

⁴⁸ Andrew Chu and Roopma Wadhwa, “Selective Serotonin Reuptake Inhibitors,” National Library of Medicine, May 1, 2023, <https://www.ncbi.nlm.nih.gov/books/NBK554406/#:~:text=All%20patients%20under%20the%20age,Go%20to:>.

Trial Report of Bradley Zicherman, MD

treating social media addiction, in my clinical experience, leads to overall improvement in a patient's mental health and functional status.

V. Many Instagram features are harmful to teen and youth mental health, and Meta’s Teen Accounts are often ineffective at addressing those harms

- (55) As of September 2024, Instagram introduced “Teen Accounts” for users between the ages of 13 and 17.⁴⁹ In April 2025, Meta announced that it was expanding Teen Accounts to Facebook and Messenger and adding additional Instagram restrictions.⁵⁰ Instagram Teen Accounts are intended to provide the following built-in restrictions: (1) default private accounts, (2) messaging restrictions, (3) sensitive content restrictions, (4) limited interactions, (5) time limit reminders, and (6) sleep mode enabled.⁵¹ In April 2025, Meta announced that “in the next couple of months” it would also begin prohibiting Instagram users under 16 from going Live and automatically blurring images in direct messages, with both features requiring parental permission to override.⁵² Furthermore, youth under the age of 13 are supposed to be restricted from creating Facebook or Instagram accounts, in accordance with the US Children’s Online Privacy Protection Act (COPPA), which restricts the collection of personal data from children under the age of 13.⁵³
- (56) These Teen Accounts with intended built-in restrictions were not implemented until September 2024, with some yet to take effect, leaving many youth largely unprotected for many years. Even after Meta’s introduction of Teen Accounts, in my experience the restrictions are often ineffective, which nullifies any protection intended for children and teens. I am frequently informed by parents that their child was able to bypass age restrictions (including youth under 13 and teens), and the youth I am working with often inform me that they are not on a Teen Account. Youth that I work with describe the ease with which they are able to create a “regular” Instagram account and will describe often

⁴⁹ “Introducing Instagram Teen Accounts: Built-In Protections for Teens, Peace of Mind for Parents,” Instagram, September 17, 2024, <https://about.instagram.com/blog/announcements/instagram-teen-accounts>.

⁵⁰ “We’re Introducing New Built-In Restrictions for Instagram Teen Accounts, and Expanding to Facebook and Messenger,” Meta, April 8, 2024, <https://about.fb.com/news/2025/04/introducing-new-built-in-restrictions-instagram-teen-accounts-expanding-facebook-messenger>.

⁵¹ “Introducing Instagram Teen Accounts: Built-In Protections for Teens, Peace of Mind for Parents,” Instagram, September 17, 2024, <https://about.instagram.com/blog/announcements/instagram-teen-accounts>: “Private accounts: With default private accounts, teens need to accept new followers and people who don’t follow them can’t see their content or interact with them. This applies to all teens under 16 (including those already on Instagram and those signing up) and teens under 18 when they sign up for the app. Messaging restrictions: Teens will be placed in the strictest messaging settings, so they can only be messaged by people they follow or are already connected to. Sensitive content restrictions: Teens will automatically be placed into the most restrictive setting of our sensitive content control, which limits the type of sensitive content (such as content that shows people fighting or promotes cosmetic procedures) teens see in places like Explore and Reels. Limited interactions: Teens can only be tagged or mentioned by people they follow. We’ll also automatically turn on the most restrictive version of our anti-bullying feature, Hidden Words, so that offensive words and phrases will be filtered out of teens’ comments and DM [Direct Message] requests. Time limit reminders: Teens will get notifications telling them to leave the app after 60 minutes each day. Sleep mode enabled: Sleep mode will be turned on between 10 PM and 7 AM, which will mute notifications overnight and send auto-replies to DMs.”

⁵² “We’re Introducing New Built-In Restrictions for Instagram Teen Accounts, and Expanding to Facebook and Messenger,” Meta, April 8, 2024, <https://about.fb.com/news/2025/04/introducing-new-built-in-restrictions-instagram-teen-accounts-expanding-facebook-messenger>.

⁵³ Children’s Online Privacy Protection Act of 1998, 15 U.S.C. §6501–6505 (1998).

having multiple “burner” accounts. Many families that I work with will say that they have given up attempting to regulate and restrict their child’s access to apps such as Instagram because of the ineffective app restrictions.

- (57) There are many features of Instagram that are harmful to youth based on my clinical experiences, including features of both “regular” and Teen Accounts. The Instagram features that increase app time use in youth in my experience include push notifications, automatically played video, infinite scrolling, gamification, autoplay and reels, and recommendation algorithms. With regards to “recommendation algorithms” this tool detects individual patterns of computer use and preferences, then continues to display similar patterns, encouraging a user to stay on the app. The “gamification” of apps and systems inputs fun elements into social media-based activities, resulting in reinforcing dopamine hits. In my clinical experience, these features encourage extended use and constant checking of the social media application and make it difficult for youth to disengage from the app.
- (58) Push notifications are an incredibly problematic aspect of Instagram, perhaps its most powerful hook. Notifications are a default setting, even in Teen Accounts (which as described above are frequently bypassed by teen users) outside of the hours between 10 PM and 7 AM.⁵⁴ Push notifications alert users to constantly check the app for new likes and comments, follower requests, direct messages, story views, and more.⁵⁵ These notifications trigger a dopamine release, reinforcing the behavior of habitual checking of the social media app.⁵⁶ In my clinical work, I believe that these frequent pings are especially detrimental to children and teens as they disrupt focus on school, disrupt sleep, lead to heightened anxiety, and lead to increased compulsive screen checking and ultimately time spent on the app. The American Academy of Sleep Medicine recommends that all electronic devices be turned off at least 30–60 minutes before bed.⁵⁷ Electronic devices, particularly smartphones used to access social media, are incredibly stimulating. If Teen Accounts allow for notifications until 10 PM, a teen may not be able to settle down into a healthy sleep routine and fall asleep until 11 PM or later, which may be too late for teens.
- (59) Current time limit reminders that are default in Teen Accounts only serve as a soft nudge. These settings do not lock a teen out of their account and can easily be “swiped” away, ignored, or bypassed altogether using regular accounts. As described above, teens I work with often do not think they have a problem and thus are not likely to take soft nudges like these seriously. Furthermore, researchers

⁵⁴ “Introducing Instagram Teen Accounts: Built-In Protections for Teens, Peace of Mind for Parents,” Instagram, September 17, 2024, <https://about.instagram.com/blog/announcements/instagram-teen-accounts>.

⁵⁵ Seul-Kee Kim, So-Yeong Kim, Hang-Bong Kang, “An Analysis of the Effects of Smartphone Push Notifications on Task Performance with regard to Smartphone Overuse Using ERP,” *Computational Intelligence and Neuroscience* (2016): 5718580.

⁵⁶ Zoe Wyatt, “Wired for Want: How Dopamine Drives the New Epidemic of Everyday Addictions,” *Psychiatry and Behavioral Health* 4, no. 1 (2025): 1–6.

⁵⁷ “Video Games and Social Media: Factors Disrupting Healthy Student Sleep,” American Academy of Sleep Medicine, August 14, 2023, <https://aasm.org/video-games-and-social-media-factors-disrupting-healthy-student-sleep/>.

have found that these types of soft nudges may have no effect on reducing problematic smartphone use, screen time, or frequency of phone-checking.⁵⁸ In my clinical experience, soft nudges may even have a counter effect and increase use instead of curbing it, as soft nudges ultimately serve as an overall reminder of the app and can lead to increased engagement rather than disconnection.

- (60) Regarding the private accounts, messaging restrictions, sensitive content restrictions, and limited interactions features of Teen Accounts, these do not prevent adult-teen or other problematic interactions outside of parents supervising the account, which limits their effectiveness. Patients I have treated for eating disorders and substance use disorders, in particular, tell me how easily they are exposed to risky social media content, even when trying to work towards recovery.
- (61) Ultimately, even when social media platforms claim to implement protective features like Teen Accounts and parents attempt to set limits on time allowed through their smart phone device controls, the dynamic I frequently observe in clinic prior to treatment is that teens have continually pushed against boundaries and limits, and parents become fatigued and eventually relinquish control, leading to unlimited social media access.

⁵⁸ Karina Loid, Karin Täht, and Dmitri Rozgonjuk, “Do pop-up notifications regarding smartphone use decrease screen time, phone checking behavior, and self-reported problematic smartphone use? Evidence from a two-month experimental study,” *Computers in Human Behavior* 102, 22–30.

Trial Report of Bradley Zicherman, MD

The undersigned hereby certifies their understanding that they owe a primary and overriding duty of candor and professional integrity to help the Court on matters within their expertise and in all submissions to, or testimony before, the Court. The undersigned further certifies that their report and opinions are not being presented for any improper purpose, such as to harass, cause unnecessary delay, or needlessly increase the cost of litigation.

A handwritten signature in dark ink, appearing to read 'B. Zicherman MD', is positioned above a horizontal line.

Bradley Zicherman, MD

May 16, 2025

Date

Appendix A. Materials considered

In addition to all materials below, I incorporate by reference all materials used or cited in footnotes or my reliance materials.⁵⁹

A.1. Legal and other case documents

- Complaint for Injunctive and Other Relief. *People of the State of California, et al. v. Meta Platforms, Inc., et al.* (N.D. Cal. Nos. 4:22-md-03047-YGR-PHK and 4:23-cv-05448-YGR) (November 22, 2023).
- Defendants' Objections and Responses to Plaintiff's Second Set of Interrogatories. *Commonwealth of Massachusetts v. Meta Platforms, Inc. and Instagram, LLC.* (Mass. Ct. No. 2384CV02397-BLS1) (August 20, 2024).
- Meta Defendants' Responses and Objections to Plaintiffs' Second Set of Interrogatories. *People of the State of California, et al. v. Meta Platforms, Inc., et al.* (N.D. Cal. No. 4:22-md-03047-YGR) (November 27, 2024).
- Meta Defendants' Third Supplemental and Amended Responses and Objections to Plaintiffs' Second Set of Interrogatories. *People of the State of California, et al. v. Meta Platforms, Inc., et al.* (N.D. Cal. No. 4:22-md-03047-YGR) (February 28, 2025).
- Defendants' Sixth Supplemental Responses and Objections to Second Set of Interrogatories. *People of the State of California, et al. v. Meta Platforms, Inc., et al.* (N.D. Cal. Nos. 4:22-md-03047-YGR) (April 04, 2025).

A.2. Books and academic papers

- Alejandro L. Mujica, Charles R. Crowell, Michael A. Villano, and Khutb M. Uddin, "Addiction By Design: Some Dimensions and Challenges of Excessive Social Media Use," *Medical Research Archives* 10, no. 2 (2022): 1–29.
- Alexandra Dane, Komal Bhatia, "The Social Media Diet: A Scoping Review to Investigate the Association Between Social Media, Body Image and Eating Disorders Amongst Young People," *PLOS Global Public Health*, no. 3 (2023): e0001091.

⁵⁹ This appendix includes documents that I cited in footnotes throughout the report as well as documents that I considered, but did not cite explicitly.

- Alfonso Pellegrino, Alessandro Stasi, and Veera Bhatiasavi, “Research Trends in Social Media Addiction and Problematic Social Media Use: A Bibliometric Analysis,” *Frontiers in Psychiatry* 13 (2022): 1017506.
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition, Text Revision. Washington, DC, American Psychiatric Association, 2022
- American Psychiatric Association: *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013.
- Anna Lembke, “Dopamine Nation: Finding Balance in the Age of Indulgence,” Penguin Publishing Group, 2021: 77.
- B.J. Casey and Kristina Caudle, “The Teenage Brain: Self Control,” *Current Directions in Psychological Science* 22, no. 2 (2013): 82–87.
- B.J. Casey, Rebecca Jones, and Todd Hare, “The Adolescent Brain,” *Annals of the New York Academy of Sciences* 1124 (2008): 111–126.
- Caroline King, Tamara Beetham, Natasha Smith, Honora Englander, Dana Button, Patrick C M Brown, Scott E Hadland, Sarah M Bagley, Olivia Rae Wright, P Todd Korthuis, Ryan Cook, “Adolescent Residential Addiction Treatment In The US: Uneven Access, Waitlists, And High Costs,” *Health Aff (Millwood)* 43, no. 1 (2024): 64-71.
- D. Hipp, E. C. Blakley, N. Hipp, P. Gerhardstein, B. Kennedy, and Tracy Markle, “The Digital Media Overuse Scale (dMOS): A Modular and Extendible Questionnaire for Indexing Digital Media Overuse,” *Technology, Mind, and Behavior*, 4 (3: Fall 2023).
- Daria Kuss and Mark D. Griffiths, “Online Social Networking and Addiction—A Review of the Psychological Literature,” *International Journal of Environmental Research and Public Health* 8, no. 9 (2011): 3528–3552.
- Debasmita De, Mazen El Jamal, Eda Aydemir, and Anika Khera, “Social Media Algorithms and Teen Addiction: Neurophysiological Impact and Ethical Considerations,” *Cureus* 17, no. 1 (2025): 1–7.
- Earl Miller, and Jonathan Cohen, “An Integrative Theory of Prefrontal Cortex Function,” *Annual Review of Neuroscience* 24, no. 1 (2001): 167–202. Adele Diamond, “Executive Functions,” *Annual Review of Psychology* 64, no. 1 (2013): 135–168.
- Eric J. Nestler, “Is There a Common Molecular Pathway for Addiction?” *Nature Neuroscience* 8, no. 11 (2005): 1445–1449.
- Eva H.Telzer, Andrew J. Fuligni, Matthew D. Lieberman, and Adriana Galván, “The Effects of Poor Quality Sleep on Brain Function and Risk Taking in Adolescence,” *NeuroImage* 71 (2013): 275–283.

- Faisal A. Nawaz, Mehr Muhammad Adeel Riaz, Nimrat ul ain Banday, Aakanksha Singh, Zara Arshad, Hanan Derby, Meshal A. Sultan, "Social Media Use Among Adolescents With Eating Disorders: A Double-edged Sword," *Frontiers in Psychiatry*, 15 (2024): 1300182.
- Ilaria Cataldo, Joël Billieux, Gianluca Esposito, and Ornella Corazza, "Assessing Problematic Use of Social Media: Where Do We Stand and What Can Be Improved?" *Current Opinion in Behavioral Sciences* 45 (2022): 101145.
- Jan Dieris-Hirche, Laura Bottel, Magdalena Pape, Bert Theodor Te Wildt, Klaus Wölfling, Peter Henningsen, Nina Timmesfeld et al, "Effects of an Online-based Motivational Intervention to Reduce Problematic Internet Use and Promote Treatment Motivation in Internet Gaming Disorder and Internet Use Disorder (OMPRIS): Study Protocol for a Randomised Controlled Trial," *BMJ Open* 11, no. 8 (2021): e045840.
- Jason M. Nagata, Christopher M. Lee, Jacqueline O. Hur, and Fiona C. Baker, "What We Know About Screen Time and Social Media in Early Adolescence: A Review of Findings From the Adolescent Brain Cognitive Development Study," *Current Opinion in Pediatrics* (2025): 1–8.
- Jessica Ballesteros-Holmes, Malinda Teague, and Anne Derouin, "Decreasing Social Media Use Through Motivational Interviewing: A Pediatric Primary Care Quality Improvement Project," *Journal of Pediatric Health Care* 38, no. 6 (2024): 903–911.
- Kerstin Paschke, Maria Isabella Austermann, and Rainer Thomasius, "ICD-11-Based Assessment of Social Media Use Disorder in Adolescents: Development and Validation of the Social Media Use Disorder Scale for Adolescents," *Frontiers in Psychiatry* 12 (2021): 661483.
- Laurence Steinberg, "A Social Neuroscience Perspective on Adolescent Risk-taking," *Developmental Review* 28, no. 1 (2008): 78–106.
- Laurence Steinberg, "Cognitive and Affective Development in Adolescence," *Trends in Cognitive Sciences* 9, no. 2 (2005): 69–74.
- Linda Patia Spear, "Adolescent Neurodevelopment," *Journal of Adolescent Health* 52, no. 2 (2013): S7–S13.
- Maria Chiara D'Arienzo, Valentina Boursier, and Mark D. Griffiths, "Addiction to Social Media and Attachment Styles: A Systematic Literature Review," *International Journal of Mental Health and Addiction* 17 (2019): 1094–1118.
- Mariam Arain, Maliha Haque, Lina Johal, Puja Mathur, Wynand Nel, Afsha Rais, Ranbir Sandhu, and Sushil Sharma, "Maturation of the Adolescent Brain," *Neuropsychiatric Disease and Treatment* 9 (2013): 449–461.
- Mark Griffiths, Daria Kuss, and Zsolt Demetrovics, "Social Networking Addiction: An Overview of Preliminary Findings," *Behavioral Addictions* (2014): 119–141.

- Matthias Brand, Hans-Jürgen Rumpf, Zsolt Demetrovics, Astrid Müller, Rudolf Stark, Daniel L. King, Anna E. Goudriaan et al, “Which Conditions Should be Considered as Disorders in the International Classification of Diseases (ICD-11) Designation of “Other Specified Disorders Due to Addictive Behaviors,” *Journal of Behavioral Addictions* 11, no. 2 (2022): 150–159.
- Melissa Hunt, Rachel Marx, Courtney Lipson, and Jordyn Young, “No More FOMO: Limiting Social Media Decreases Loneliness and Depression,” *Journal of Social and Clinical Psychology* 37, no. 10 (2018): 751–768.
- Mereerat Manwong, Vitool Lohsoonthorn, Thanvaruj Booranasuksakul, and Anun Chaikoolvatana, “Effects of a Group Activity-based Motivational Enhancement Therapy Program on Social Media Addictive Behaviors Among Junior High School Students in Thailand: A Cluster Randomized Trial,” *Psychology Research and Behavior Management* (2018): 329–339.
- Mohamed Basel Almourad, John McAlaney, Tiffany Skinner, Megan Pleya, and Raian Ali, “Defining Digital Addiction: Key Features From the Literature,” *Psihologija* 53, no. 3 (2020): 237–253.
- Naomi Friedman and Trevor Robbins, “The Role of Prefrontal Cortex in Cognitive Control and Executive Function,” *Neuropsychopharmacology* 47, no. 1 (2022): 72–89.
- Oriana Perez, Tatyana Garza, Olivia Hinder, Alicia Beltran, Salma M. Musaad, Tracey Dibbs, Anu Singh et al, “Validated Assessment Tools for Screen Media Use: A Systematic Review,” *PLOS One* 18, no. 4 (2023): 0283714.
- Paige Coyne and Sarah J. Woodruff, “Taking a Break: The Effects of Partaking in a Two-Week Social Media Digital Detox on Problematic Smartphone and Social Media Use, and Other Health-Related Outcomes among Young Adults,” *Behavioral Sciences* 13, no. 12 (2023): 1004.
- Robert E. Roberts, Catherine Ramsay Roberts, and Hao T. Duong, “Sleepless in Adolescence: Prospective Data on Sleep Deprivation, Health and Functioning,” *Journal of Adolescence* 32, no. 5 (2009): 1045–1057.
- Robert G. Lewis, Ermanno Florio, Daniela Punzo, and Emiliana Borrelli, “The Brain’s Reward System in Health and Disease,” *Circadian Clock in Brain Health and Disease: Advances in Experimental Medicine and Biology*, vol 1344. Springer, 2021: 57–69.
- Sarah Domoff, Kristen Harrison, Ashley N. Gearhardt, Douglas A. Gentile, Julie C. Lumeng, and Alison L. Miller, “Development and Validation of the Problematic Media Use Measure: A Parent Report Measure of Screen Media ‘Addiction’ in Children,” *Psychology of Popular Media Culture* 8, no. 1 (2019): 2–11.
- Sarah-Jayne Blakemore, “Imaging Brain Development: The Adolescent Brain,” *NeuroImage* 61, no. 2 (2012): 397–406.

- Seul-Kee Kim, So-Yeong Kim, Hang-Bong Kang, "An Analysis of the Effects of Smartphone Push Notifications on Task Performance with regard to Smartphone Overuse Using ERP," *Computational Intelligence and Neuroscience* (2016): 5718580.
- Tania Moretta and Elisa Wegmann, "Toward the Classification of Social Media Use Disorder: Clinical Characterization and Proposed Diagnostic Criteria," *Addictive Behaviors Reports* 21 (2025): 100603.
- Tania Moretta and Elisa Wegmann, "Toward the Classification of Social Media Use Disorder: Clinical Characterization and Proposed Diagnostic Criteria," *Addictive Behaviors Reports* 21 (2025): 100603.
- Xingchen Zhou, Pei-Luen Patrick Rau, Chi-Lan Yang, and Xiaofei Zhou, "Cognitive Behavioral Therapy-Based Short-Term Abstinence Intervention for Problematic Social Media Use: Improved Well-Being and Underlying Mechanisms," *Psychiatric Quarterly* 92 (2021): 761–779.
- Yvonne Kelly, Afshin Zilanawala, Cara Booker, Amanda Sacker, "Social Media Use and Adolescent Mental Health: Findings From the UK Millennium Cohort Study," *eClinicalMedicine*, vol 6 (2018): 59–68.
- Zoe Wyatt, "Wired for Want: How Dopamine Drives the New Epidemic of Everyday Addictions," *Psychiatry and Behavioral Health* 4, no. 1 (2025): 1–6.

A.3. Websites, articles, and press releases

- "ASPIRE," El Camino Health, accessed April 29, 2025, <https://www.elcaminohealth.org/services/mental-health/specialty-programs/aspire>.
- "Buprenorphine," Substance Abuse and Mental Health Services Administration, accessed April 29, 2025, <https://www.samhsa.gov/substance-use/treatment/options/buprenorphine>.
- "Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)," American Psychiatric Association, accessed April 29, 2025, <https://www.psychiatry.org/psychiatrists/practice/dsm>.
- "Facebook to Acquire Instagram," Meta Newsroom, April 9, 2012, <https://about.fb.com/news/2012/04/facebook-to-acquire-instagram/>.
- "Health Advisory on Social Media Use in Adolescence," American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/health-advisory-adolescent-social-media-use>.
- "International Statistical Classification of Diseases and Related Health Problems (ICD)," World Health Organization, accessed April 29, 2025, <https://www.who.int/standards/classifications/classification-of-diseases>.

- “Introducing Instagram Teen Accounts: Built-In Protections for Teens, Peace of Mind for Parents,” Instagram, September 17, 2024, <https://about.instagram.com/blog/announcements/instagram-teen-accounts>.
- “Naloxone DrugFacts,” National Institute on Drug Abuse, accessed April 29, 2025, <https://nida.nih.gov/publications/drugfacts/naloxone>
- “Naltrexone,” Substance Abuse and Mental Health Services Administration, accessed April 29, 2025, <https://www.samhsa.gov/substance-use/treatment/options/naltrexone>.
- “Potential Risks of Content, Features, and Functions: The Science of How Social Media Affects Youth,” American Psychological Association, accessed April 29, 2025, <https://www.apa.org/topics/social-media-internet/youth-social-media-2024>.
- “Recovery Clinic,” Stanford Medicine, Division of Child and Adolescent Psychiatry and Child Development, accessed April 29, 2025, <https://med.stanford.edu/childpsychiatry/clinical/addiction.html>.
- “Residential Addiction Treatment for Adolescents is Scarce and Expensive,” National Institutes of Health, accessed May 14, 2025, <https://www.nih.gov/news-events/news-releases/residential-addiction-treatment-adolescents-scarce-expensive?utm>.
- “Search Results: Internet Addiction, Residential, Adolescents,” Recovery.com, accessed May 14, 2025, <https://recovery.com/>.
- “Search Results: Social Media Addiction Measurement Tool,” Stanford Medicine Lane Medical Library, accessed May 8, 2025, <https://lane.stanford.edu/search.html?q=social+media+addiction+measurement+tool&source=all-all&facets=recordType%3A%22pubmed%22>.
- “Search Results: Social Media Addiction,” Stanford Medicine Lane Medical Library, accessed May 8, 2025, <https://lane.stanford.edu/search.html?q=social+media+addiction&source=all-all&facets=recordType%3A%22pubmed%22>.
- “Share of Online Users in the United States Who Report Being Addicted to Social Media as of April 2019, by Age Group,” Statista, August 2019, <https://www.statista.com/statistics/1081292/social-media-addiction-by-age-usa/>.
- “Video Games and Social Media: Factors Disrupting Healthy Student Sleep,” American Academy of Sleep Medicine, August 14, 2023, <https://aasm.org/video-games-and-social-media-factors-disrupting-healthy-student-sleep/>
- “We’re Introducing New Built-In Restrictions for Instagram Teen Accounts, and Expanding to Facebook and Messenger,” Meta, April 8, 2024, <https://about.fb.com/news/2025/04/introducing-new-built-in-restrictions-instagram-teen-accounts-expanding-facebook-messenger>.

Trial Report of Bradley Zicherman, MD

- “What is Technology Addiction?” American Psychiatric Association, accessed April 29, 2025, <https://www.psychiatry.org/patients-families/technology-addictions-social-media-and-more/what-is-technology-addiction>.
- Nasha Addarich Martínez, “Rest and Recharge with These Tips for Social Media Detoxing,” CNET, March 4, 2025, <https://www.cnet.com/health/mental/rest-and-recharge-with-these-tips-for-social-media-detoxing/>.
- Nasha Addarich Martínez, “Rest and Recharge with These Tips for Social Media Detoxing,” CNET, March 4, 2025, <https://www.cnet.com/health/mental/rest-and-recharge-with-these-tips-for-social-media-detoxing/>.
- Ruthann Richter, “Among Teens, Sleep Deprivation an Epidemic,” Stanford Medicine News Center, October 8, 2015, <https://med.stanford.edu/news/all-news/2015/10/among-teens-sleep-deprivation-an-epidemic.html>.
- Zara Abrams, “Why Young Brains are Especially Vulnerable to Social Media,” American Psychological Association, August 3, 2023, <https://www.apa.org/news/apa/2022/social-media-children-teens>.

Trial Report of Bradley Zicherman, MD

Appendix B. Curriculum vitae of Bradley Zicherman, MD

Bradley Zicherman, M.D.

Undergraduate Education

- University of Michigan-Ann Arbor, 2001-2005, Bachelor's in General Studies (B.G.S.) 2005

Medical Education

- American University of the Caribbean, Netherland Antilles, 2006-2011, (M.D.) 2011

Residency and Fellowship Training

- Psychiatry Resident, Texas Tech University Health Sciences Center (TTUHSC), Lubbock TX, July 2012-June 2015
- Child and Adolescent Psychiatry Fellow, University of South Florida (USF), Tampa FL, July 2015-June 2017
 - Chief Fellow 2016-2017
- Addiction Psychiatry Fellow, University of California-San Francisco (UCSF), San Francisco CA, July 2017-June 2018
- Forensic Psychiatry Fellow, Oregon Health Sciences University (OHSU), Portland OR, July 2018- June 2019

Academic Positions

- Clinical Assistant Professor, Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences @ the Stanford University School of Medicine (SoM), Palo Alto, CA, November 2019-September 2024
- Clinical Associate Professor, Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences @ the Stanford University School of Medicine (SoM), Palo Alto, CA, October 2024-present
 - Director of the Stanford Children's Recovery Clinic, July 2023-present
 - The Recovery Clinic is an addiction disorder and dual diagnosis clinic for youth. Both behavioral and substance use addictions are treated in the clinic

Memberships, Committees, and Honorary/Professional Societies

- Selected to be resident member on University Medical Center/Texas Tech Health Sciences Center (Lubbock, TX) Hospital ethics committee, 2013
- AAAP (American Academy of Addiction Psychiatry), June 2016-present
 - Addiction and the Law Committee member, September 2021-Sept 2022
- AAPL (American Academy of Psychiatry and the Law), April 2017-present

- AACAP (American Academy of Child and Adolescent Psychiatry), December 2019-present
 - Active Media Committee contributor, January 2024-present
- ASAM (American Society of Addiction Medicine), August 2022-present
 - ASAM Connect Child and Adolescent Addictions Special Interest Group member, November 2022-present
- CSAM (California Society of Addiction Medicine), August 2022-present
 - Youth and Prevention Committee member, January 2024-present
- Member of Stanford Lucile Packard Children's Hospital Opioid Task Force, May 2022-present

Examinations/Certifications

- Helping Our Toddlers, Developing Our Children's Skills" (HOT DOCS), completed through the University of South Florida (USF)-received certificate of course completion October 2015
- ABPN (American Board of Psychiatry and Neurology), board certified in General Psychiatry, September 2016-present
- Active DEA-X License and completion of 8 hour Medication Access and Training Expansion (MATE) requirement, completed February 2017
- Active medical license in California, February 2017-present
- Trained in Parent Child Interaction Therapy (PCIT) and completed certification course through the University of South Florida (USF), 2017
- ABPN (American Board of Psychiatry and Neurology), board certified in Child and Adolescent Psychiatry, September 2018-present
- Certified adult and juvenile forensic evaluator for the state of Oregon, 2018-2020
- Board eligible in Forensic Psychiatry, July 2019-present
- ABPN (American Board of Psychiatry and Neurology), board certified in Addiction Psychiatry, October 2020-present

Stanford Teaching/Supervision Experience

- Stanford Children's Recovery Clinic
 - Supervise Child and Adolescent Psychiatry fellows, Addiction Medicine fellows and General Psychiatry residents 1-2 days per week, 2020-present
 - Providing psychotherapy supervision for Palo Alto University PsyD Psychology doctoral student, August 2024-present
- Stanford adolescent psychiatric inpatient unit
 - Supervised child and adolescent psychiatry fellows, 2021
- Supervise Stanford medical students at the El Camino Hospital Quest Dual Diagnosis program, 2021-present
- Experience as a member of Palo Alto University PsyD psychology student dissertation committee, 2021-present

- Stanford Children’s Evaluation Clinic
 - Supervised child and adolescent psychiatry fellows, 2022
- Stanford Children’s Mood Clinic
 - Supervised child and adolescent psychiatry fellow Jan 2024-June 2024

Awards

- “Above and Beyond Award” Stanford Child Psychiatry Division Award of Recognition, June 2021

Regional and National Presentations and Policy Work

- Poster presented at 26th Annual U.S Psychiatric and Mental Health Conference. “Attitude differences of patients to a proposed smoking ban on an inpatient mental health unit”, Las Vegas, NV, 2013
- Case conference “Somatization and poly-pharmacy” presented at Texas Tech Health Sciences Center (TTUHSC), Lubbock TX- Psychiatry Department Grand Rounds, 2013
- Case conference “Encountering eating disorders in the geriatric population” presented at the Texas Tech Health Sciences Center (TTUHSC), Lubbock TX- Psychiatry Department Grand Rounds, 2014
- “Alcohol use disorder pharmacotherapy”, presented at the University of California San Francisco (UCSF) Addiction Psychiatry Grand Rounds, San Francisco, CA, 2018
- “Kratom use and potential forensic concerns”, presented to the Forensic Evaluation Services department at the Oregon State Hospital, Salem OR December 2018
- “Medical cannabis in Florida”, presented at the Johns Hopkins Annual Pediatric Brain Symposium, St. Petersburg FL, October 2019
- Youth and substance use: an overview of epidemiology and treatments” presented at the University of California San Francisco (UCSF) Addiction Psychiatry Department Grand Rounds, April 2020-presented virtually, originally supposed to be presented in San Francisco, CA
- “Clinical considerations for screen addiction during a pandemic; Skills for providers”, presented at the Virtual Northern California Regional Organization of Child and Adolescent Psychiatry Annual Conference, January 2021, conference originally scheduled in Carmel-by-the-Sea, CA
- “Youth and the impacts of excessive screen time”, presented to the City of Mountain View, February 2021, presentations was virtual and likely would have taken place at El Camino Hospital before COVID-19
- “The New Vaping Information, Solutions, and Information Toolkit (VISIT) for Healthcare Providers”, presented at the 2nd Annual Teaching Cannabis Awareness & Prevention Virtual 2021 Conference, April 2021
- “Talking to youth and families about tobacco and cannabis use”, presented at the 2nd Annual teaching Cannabis Awareness & Prevention Virtual 2021 Conference, April 2021
- “Youth and the impacts of excessive screen time”, presented to El Camino Hospital, El Camino Hospital Mental Health Week, Mountain View, CA, May 2021, presentation was virtual due to COVID-19

- “Youth and screen addictions, latest trends and treatment options”, virtual webinar presented to University of California San Francisco (UCSF) Youth Outpatient Substance Use Program (YoSUP), December 2021
- “Treatment considerations for substance use and behavioral addictions” webinar presented to Stanford Autism Project for Ukraine, June 2022
- “Substance in adolescence, experimentation, addiction, and recovery”, webinar presented to El Camino Hospital Parenting CURVE (Connect. Understand. Respond. Voice. Empower) Collaborative event, April 2023
- “Evaluation and Management of Children and Adolescents with Cannabis Use”, virtual webinar presented to Hill Physicians Medical Group, September 2023
- Youth and Substance Use seminar presented to Young Men’s Service League (Crystal Springs Chapter), Redwood City CA, February 2024
- “Understanding and Managing Screen Addictions” virtual parent workshop presented through the ASPIRE (After School Program Interventions and Resiliency) program at El Camino Hospital, Mountain View, CA, September 2024
- “The Pediatric mental health crisis: understanding causes, impacts, and solutions” Virtual Grand Rounds, presented to Dominican Hospital, Santa Cruz, CA November 2024
- “The Digital Dilemma: Managing Screen Addiction and Technology Use With Your Child” virtual parent workshop presented through the ASPIRE (After School Program Interventions and Resiliency) program at El Camino Hospital, Mountain View, CA, February 2025
- “Evaluation and management of addictions in youth and young adults”, CME (continuing medical education) presentation, presented at Alta Mira Recovery Program, Sausalito, CA, April 2025
- “Digital media safety”, presented to the Palo Alto PTSA (Parent Teach Student Association), Palo Alto, CA, May 2025

Stanford Presentations

- “Social media, screen time usage and mental health”, webinar presented to the Stanford corporate sponsors, 2020
- Six part seminar series on “Youth and substance use” presented to Stanford University 2nd year Child and Adolescent Psychiatry Fellows, 2020
- “Youth and substance use”, presented to Division of Adolescent Medicine / Department of Pediatrics, 2020
- “Youth and substance use”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences Mood Disorder Clinic, 2020
- “Youth and substance use”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences Psychology trainees, 2020
- “Youth and substance use”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences Anxiety Disorders Clinic, 2020
- “Dual Diagnosis considerations when treating youth”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences General Clinic, February 2021

- “Stanford Youth Addiction Services”, presented to Stanford Lucile Packard Children’s Hospital (LPCH) Social Work Department, September 2021
- Youth and addiction seminar series presented monthly to Stanford Addiction Medicine fellows, 2021
- 6-part seminar series on “Youth and substance use” presented to Stanford University 2nd year Child and Adolescent Psychiatry Fellows, 2021
- “Dual Diagnosis considerations when treating youth”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences General Clinic, September 2021
- “Dual Diagnosis considerations when treating youth”, presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences Anxiety Disorders Clinic, September 2021
- Youth and addiction seminar series presented monthly to Stanford Addiction Medicine fellows, 2022
- Six part seminar series on “Youth and substance use” presented to Stanford University 2nd year Child and Adolescent Psychiatry Fellows, 2022
- "Dual Diagnosis considerations when treating youth", presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences General Clinic, Sept 2022
- "Dual Diagnosis considerations when treating youth", presented to Division of Child & Adolescent Psychiatry and Child Development / Department of Psychiatry and Behavioral Sciences Anxiety Clinic, Sept 2022
- “Treatment of adolescent substance use and behavioral addictions”, presented to 1st year Stanford doctoral psychology students, May 2023
- “Youth and substance addictions”, presented to Stanford undergraduate students in HUMBIO 142M/PSYCH 142A, May 2023
- Three part seminar series on transition to practice presented to Stanford Child and Adolescent Psychiatry 2nd year Fellows, 2023-2024
- Three part seminar series on “Youth and substance use”, presented to Stanford Child and Adolescent Psychiatry 2nd year Fellows, 2023-2024
- “Evaluation and management of children and adolescents with substance use”, presented to Stanford undergraduate students in PSYCH 142A: Special Topics in Adolescent Mental Health, May 2024
- Screen addictions seminar presented to Stanford Child and Adolescent Psychiatry 2nd year Fellows, June 2024
- “Evaluation of children and adolescents with cannabis use”, presented to Stanford Child Psychology Post-doctoral fellows, July 2024
- “Evaluation and management of addictions in youth and young adults”, presented to Stanford undergraduate students in HUMBIO 142M/PSYCH 142A : Special Topics in Adolescent Mental Health, May 2025
- “Evaluation and management of addictions in youth and young adults”, presented to Stanford Child Psychology Post-Doctoral fellows, May 2025

Research

- Co-investigator: “Predictors of readmission rates in an inpatient psychiatric hospital. A ‘bridge’ to better outcomes”, Texas Tech Health Sciences Center (TTUHSC), Unpublished manuscript, submitted October 2016 to Perspectives in Psychiatric Care,
- Member of California Advisory Panel as part of grant submission “N-Acetylcysteine (NAC) for Smoking Cessation in Tobacco and Cannabis Co-Use: A Randomized Controlled Trial,” grant submitted through University of California, San Francisco (UCSF) 2020-2023
- Co-investigator, Grant submission-“Feasibility, Acceptability and Efficacy of the Cannabis Awareness and Prevention Toolkit”, Stanford University, grant accepted 2020
- Co-investigator Grant submission-“Evaluation of the Be Vape Free Curriculum of the Tobacco Prevention Toolkit”, Stanford University, grant accepted 2020
- Member of Cannabis Prevention Toolkit and Tobacco Prevention Toolkit teams. These programs were initially developed by the Stanford Division of Adolescent medicine/ Department of Pediatrics. I joined the team developing these programs in 2020-present.
- Co-founder of the Stanford Vaping Information, Solutions, and Information Toolkit (VISIT) for healthcare providers, 2020-present
- NIDA (National Institute on Drug Abuse) CTN (Clinical Trials Network) -0147 Protocol Review Board member, BOND (Building Opioid recovery support Networks to engage and retain young adults in Medication for Opioid Use Disorder) April 2024-present
- Co-investigator “Stanford Screen Sense Study”, currently in IRB review, 2024-present

Publications

- “Limits to Mandatory Child Abuse Reporting” Bradley Zicherman, Joseph Chien Journal of the American Academy of Psychiatry and the Law Online Aug 2019, 47 (3) 384-385
- Thomas Bottyan, Bradley Zicherman, “Measuring Media Use in Youth”, Encyclopedia of Child and Adolescent Health (First Edition), Volume 3, Academic Press, Editor: Bonnie Halpern-Felsher, 2023, Pages 325-336
- Appointed to editorial board and as a reviewer for Addictive Behaviors Journal, 2020-present
- Journal of Addictive Disorders, manuscript reviewer, 2022-present
- Journal of Child & Adolescent Substance Use, manuscript reviewer 2024-present

Media Appearances

- BYU Sirius Radio-The Lisa Show. Topic: “What leads teens to experiment with drugs?” and “what can parents do to keep their kids safe?”, August 2021
https://www.byuradio.org/lvc-2021-08-04-teen-drug-experimentation?utm_source=byub&utm_medium=share&utm_campaign=share_2024&utm_content=Segment
- Podcast: Mind Maladies. Topic: “Addiction and substance abuse disorders.” April 2022
<https://open.spotify.com/episode/3wZSntT5AHnFBbFfW0SXVz?si=a04524af13b643b7>
- Interviewed for article in Washington Post, “Meet the parents who refuse to give their kids smartphones.” May 2022
<https://www.washingtonpost.com/lifestyle/2022/05/09/parents-kids-smartphones/>

- Podcast: Screen Time Stories. Topic: Parenting Techniques for Raising Tech Natives, September 2022
<https://open.spotify.com/episode/5XLIaZJLfVYCCnJzI3Drkp?si=58530b2ef99a4923>
- Live Television appearance KTVU FOX San Francisco Morning News. Topic: What is the appropriate age range for kids to join social media? Surgeon General's recent statement that '13 is too young' for social media. Discussion of 'screen addiction', what parents should know and how it affects a child's brain development. February 4th, 2023
<https://www.ktvu.com/video/1176281>
- Live television appearance KPIX CBS San Francisco "Kids in crisis: Should you keep your pre-teen off social media." Feb 28th, 2023
<https://www.cbsnews.com/sanfrancisco/video/kids-in-crisis-should-you-keep-your-pre-teen-off-social-media/>
- Live television appearance KTVU FOX San Francisco Morning News. Topic: Discussion of new TikTok regulations for teenage use and Surgeon General statement on the need for screen time limits. March 4th, 2023
- Moderator and panel member for "Fentanyl High" documentary screening, Fremont High School, Sunnyvale CA, March 2024 <https://www.fentanylhight.com/>
- Interviewed for article in The Campanile, "Gaming addiction grows in teens, affects social, academic life." April 2024 <https://thecampanile.org/29937/showcase/gaming-addiction-grows-in-teens-affects-social-academic-life/>
- Moderator and panel member for "Fentanyl High" documentary screening, SF Jazz venue, San Francisco CA, May 2024 <https://www.fentanylhight.com/>
- Live television appearance KNTV NBC Bay Area. Topic: Surgeons general's social media warning, June 17th 2024 <https://www.nbcbayarea.com/news/local/surgeon-generals-social-media-warning/3568905/>
- Panel member for "Fentanyl Awareness Parent Advisory" organized through the Fremont Union School District, Lynbrook High School, San Jose, CA, March 2025
- Panel member for "Virtual Youth Mental Health Symposium", organized by El Camino Hospital, Mountain View, CA, May 2025

Volunteer Experience

- Lubbock Impact Free Clinic Volunteer 2013-2015. Supervised medical students and treated patients with psychiatric and general medical issues.

Additional Work Experiences

- Gracepoint Wellness, Tampa FL. Treating psychiatrist for the child and adolescent crisis and inpatient unit. January 2016-June 2017
- Naphcare, inc., staff psychiatrist for Naphcare affiliated jails in California and Oregon. January 2019-January 2020
- Multnomah County, Oregon- Donald E. Long Detention Center, treating psychiatrist for youth residing at the detention center. January 2019-October 2019
- Hazelden Betty Ford Drug and Alcohol Rehab, Newberg, Oregon, consulting psychiatrist. January 2020-May 2022

- Camden Center Integrated Mental Health Care, Menlo Park, CA, consulting psychiatrist. February 2020-Feb 2023
- El Camino Hospital, Mountain View, CA, consulting psychiatrist for Quest youth dual diagnosis intensive outpatient program. November 2020-present
 - Developing partnership/contract to bring this program under Stanford umbrella in 2024
- Alta Mira Recovery Program, Sausalito, CA, consulting psychiatrist. February 2023-present